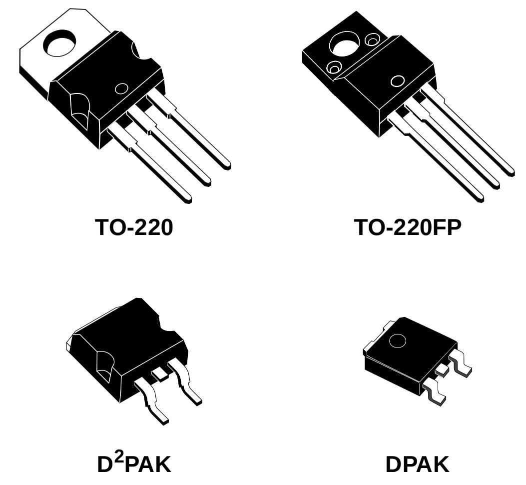
L4941

VERY LOW DROP 1A REGULATOR

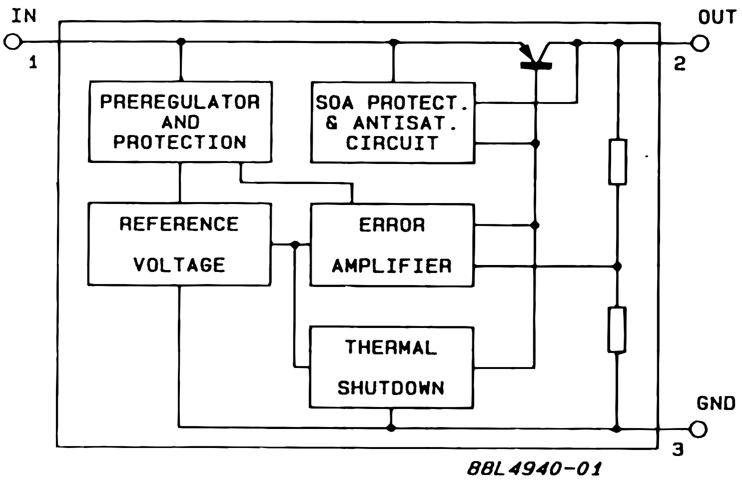
- LOW DROPOUT VOLTAGE (450mV Typ. at 1A)
- VERY LOW QUIESCENT CURRENT
- THERMAL SHUTDOWN
- SHORT CIRCUIT PROTECTION
- REVERSE POLARITY PROTECTION



DESCRIPTION

The L4941 is a three terminal 5V positive regulators available in TO-220, TO-220FP and D^2PAK packages, making it useful in a wide range of industrial and consumer applications. Thanks to its very low input/output voltage drop, these devices are particularly suitable for battery powered equipments, reducing consumption and prolonging battery life. It employs internal current limiting, antisaturation circuit, thermal shut-down and safe area protection.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

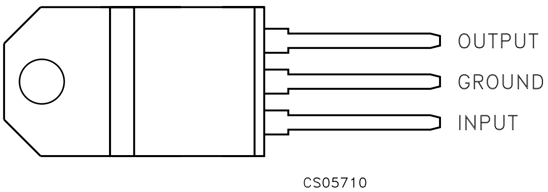
Symbol	Parameter	Value	Unit
V_I	Forward Input Voltage	30	V
V_{IR}	Reverse Input Voltage (R_O=100Ω)	-15	V
I_O	Output Current	Internally Limited	mA
P_D	Power Dissipation	Internally Limited	mW
T_{stg}	Storage Temperature Range	-40 to +150	°C
T_{op}	Operating Junction Temperature Range	-40 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

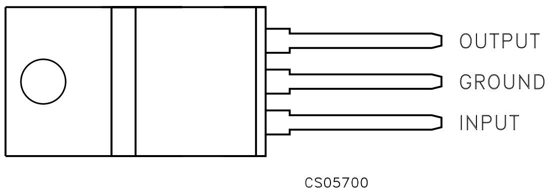
THERMAL DATA

Symbol	Parameter	TO-220	TO-220FP	D^2PAK	DPAK	Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	3	5	3	8	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	50	60	62.5	100	°C/W

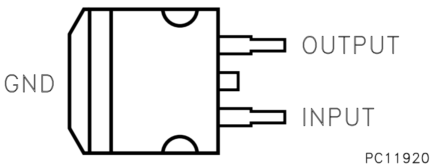
CONNECTION DIAGRAM (top view)



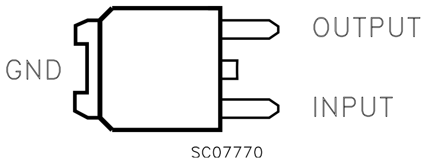
TO-220



TO-220FP



D^2PAK



DPAK

ORDERING CODES

ORDERING CODE	PACKAGE
L4941BV	TO-220
L4941BP	TO-220FP
L4941BD2T	D^2PAK
L4941BDT (*)	DPAK

(*) Available in Tape & Reel with the suffix "-TR".

TEST CIRCUITS

Figure 1 : DC Parameter

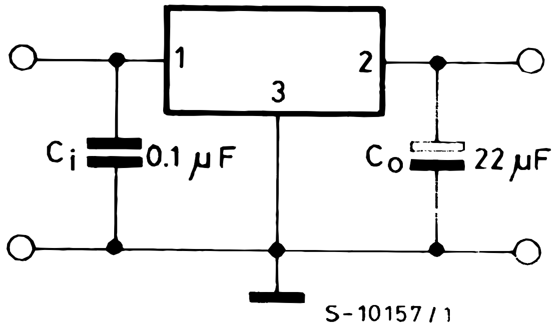


Figure 2 : Load Rejection

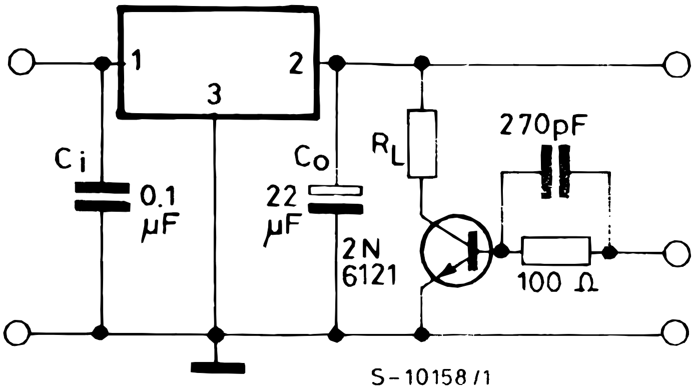
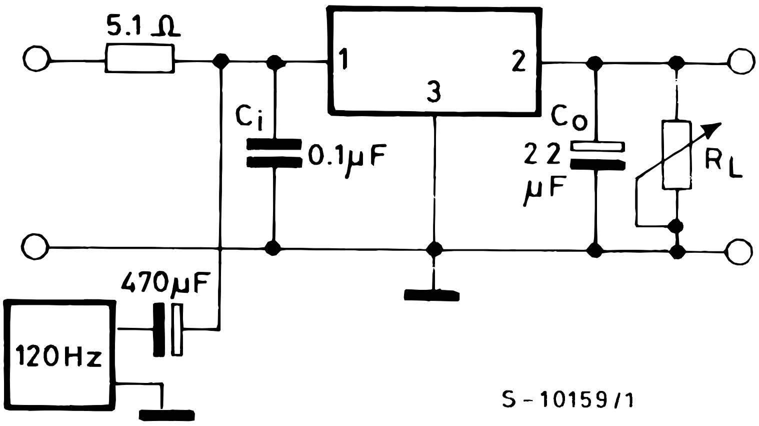


Figure 3 : Ripple Rejection



ELECTRICAL CHARACTERISTICS (Refer to test circuit, V_I=7V, C_I = 0.1µF, C_O = 22µF, T_J = 25°C, unless otherwise specified.)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
V_O	Output Voltage	I_O = 5mA to 1A	V_I = 6 to 14V	4.8	5	5.2	V
V_I	Input Voltage	I_O = 5 mA				16	V
ΔV_O	Line Regulation	V_I = 6 to 16V	I_O = 5 mA		5	20	mV
ΔV_O	Load Regulation	I_O = 5mA to 1A			8	20	mV
		I_O = 0.5A to 1A			5	15	mV
I_q	Quiescent Current	I_O = 5 mA	V_I = 6V		4	8	mA
		I_O = 1A	V_I = 6V		20	40	mA
ΔI_q	Quiescent Current Change	I_O = 5 mA	V_I = 6 to 14V			3	mA
		I_O = 1A	V_I = 6 to 14V			-10	mA
V_d	Dropout Voltage	I_O = 0.5A			250	450	mV
		I_O = 1A			450	700	mV
$\Delta V_O/\Delta T$	Output Voltage Drift				0.6		mv/°C
SVR	Supply Voltage Rejection	f = 120Hz	I_O = 1A	58	68		dB
I_{sc}	Short Circuit Current	V_I = 14V			1.6	2.0	A
		V_I = 6V			1.8	2.2	
Z_O	Output Impedance	f = 1KHz	I_O = 0.5A		30		mΩ
e_N	Output Noise Voltage	B = 100Hz to 100KHz			30		µV/V_O

TYPICAL CHARACTERISTICS

Figure 4 : Dropout Voltage vs Output Current

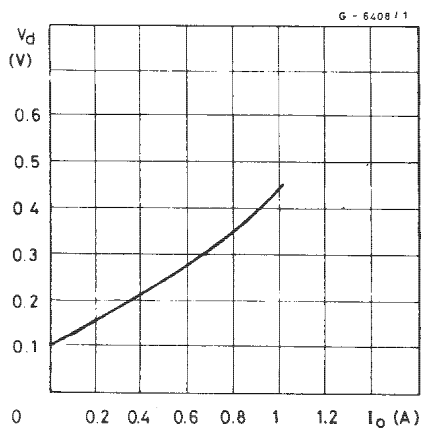


Figure 5 : Dropout Voltage vs Temperature

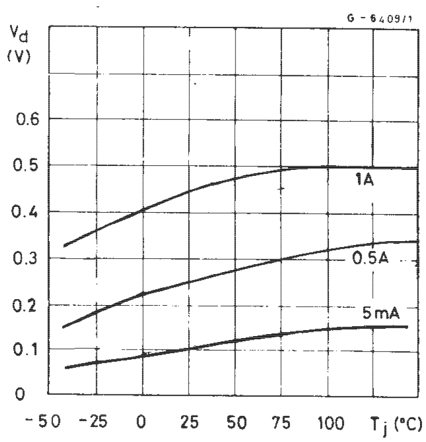


Figure 6 : Output Voltage vs Temperature

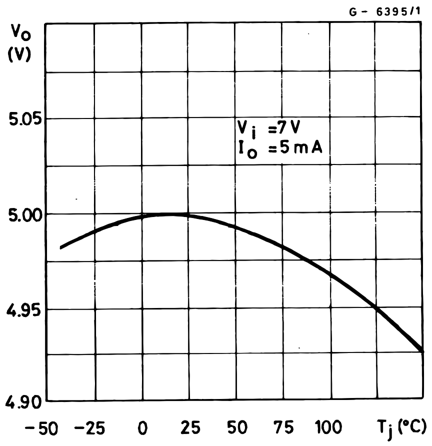


Figure 9 : Quiescent Current vs Output Current

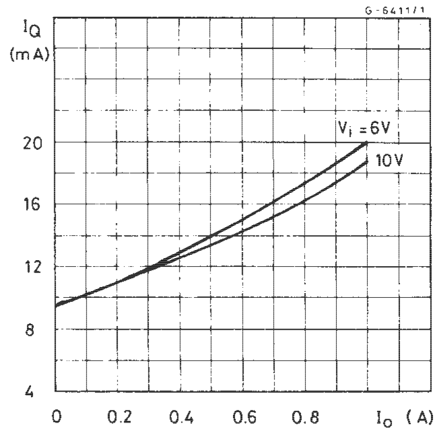


Figure 7 : Quiescent Current vs Temperature

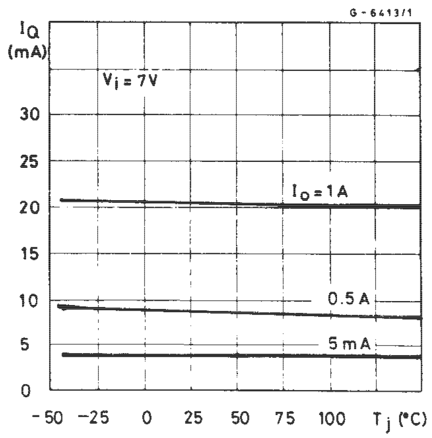


Figure 10 : Short Circuit Current vs Temperature

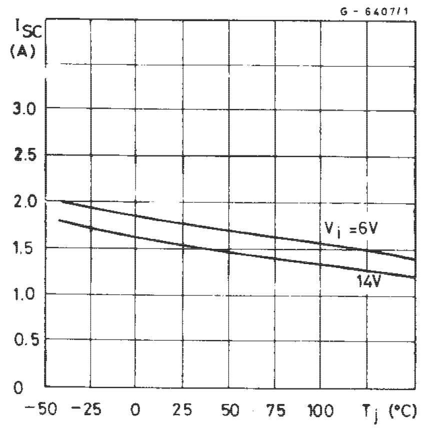


Figure 8 : Quiescent Current vs Input Voltage

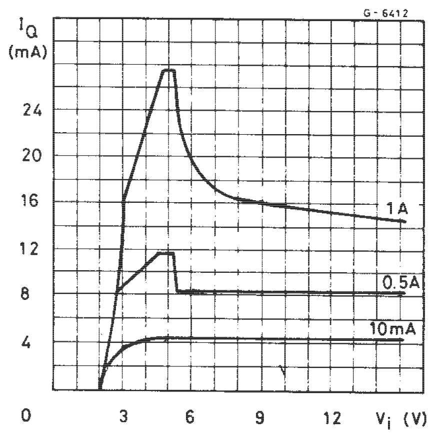


Figure 11 : Peak Output Current vs Input/Output Differential Voltage

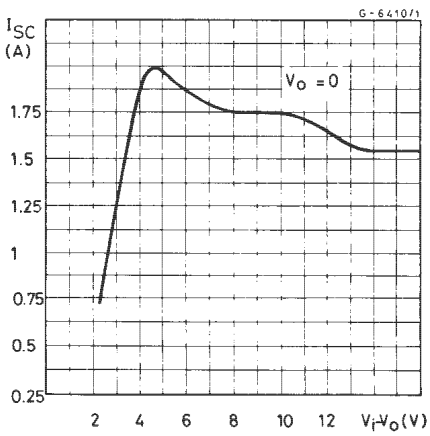


Figure 12 : Low Voltage Behavior

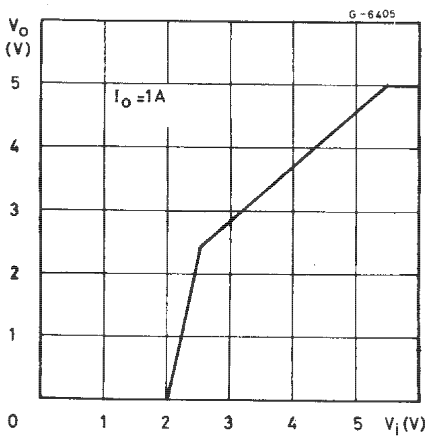


Figure 15 : Load Dump Characteristics

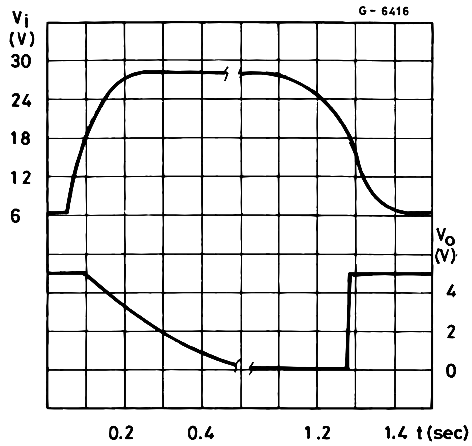


Figure 13 : Supply Voltage Rejection vs Frequency

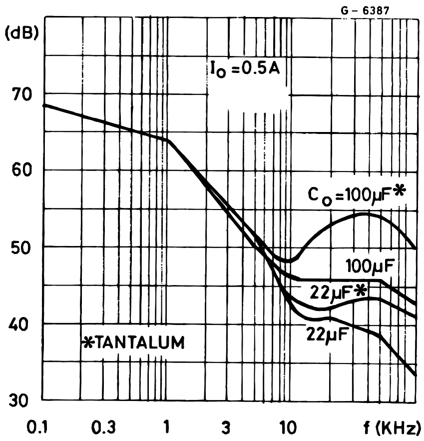


Figure 16 : Line Transient Response

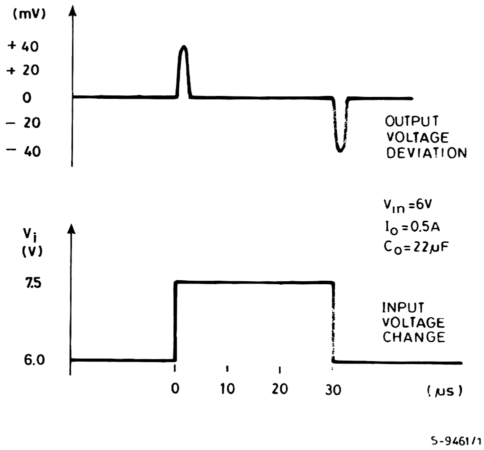


Figure 14 : Supply Voltage Rejection vs Output Current

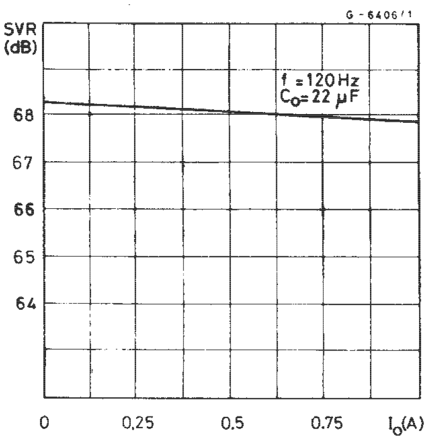


Figure 17 : Total Power Dissipation

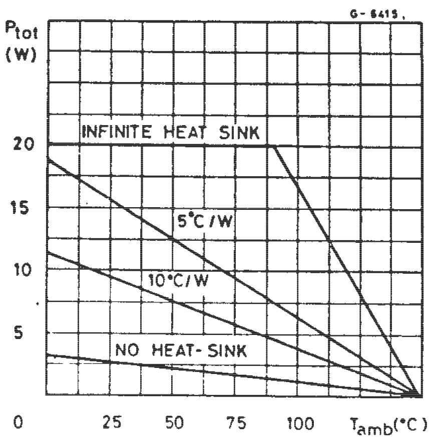


Figure 18 : Load transient Response

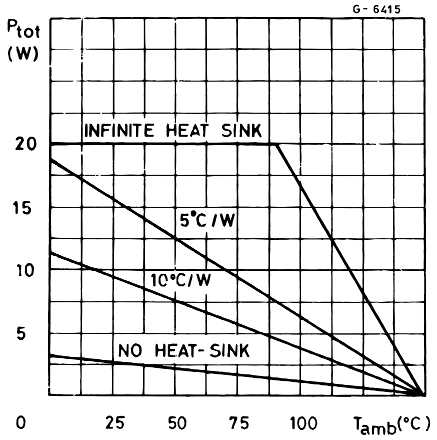


Figure 19 : Distributed Supply with On-card L4940 and L4941 low drop regulator

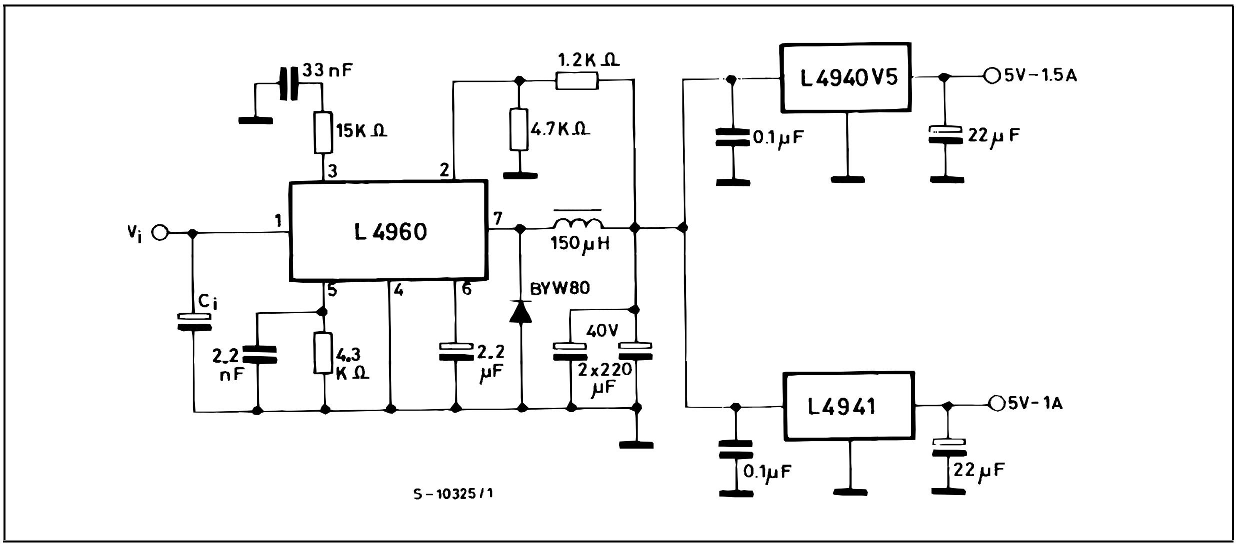
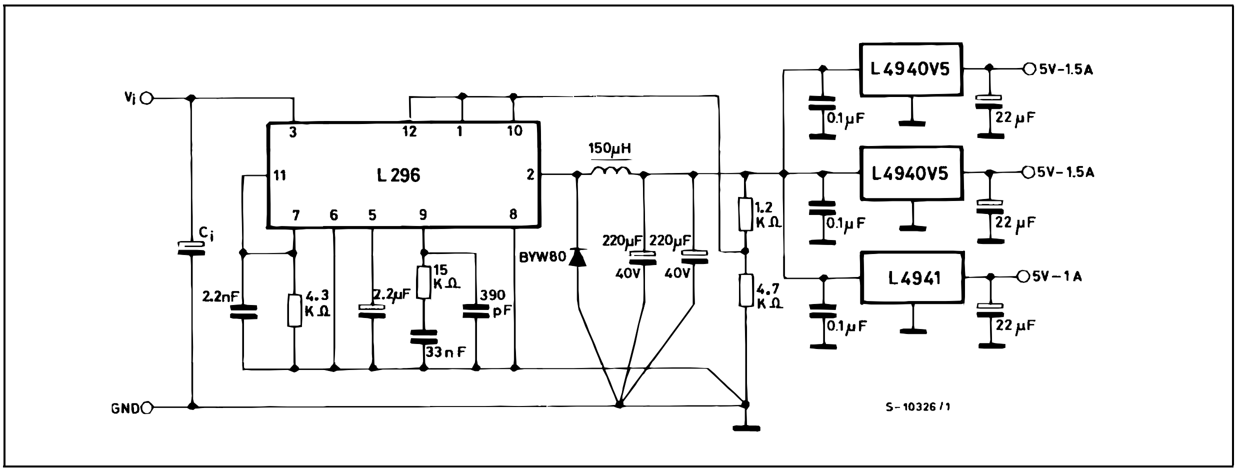


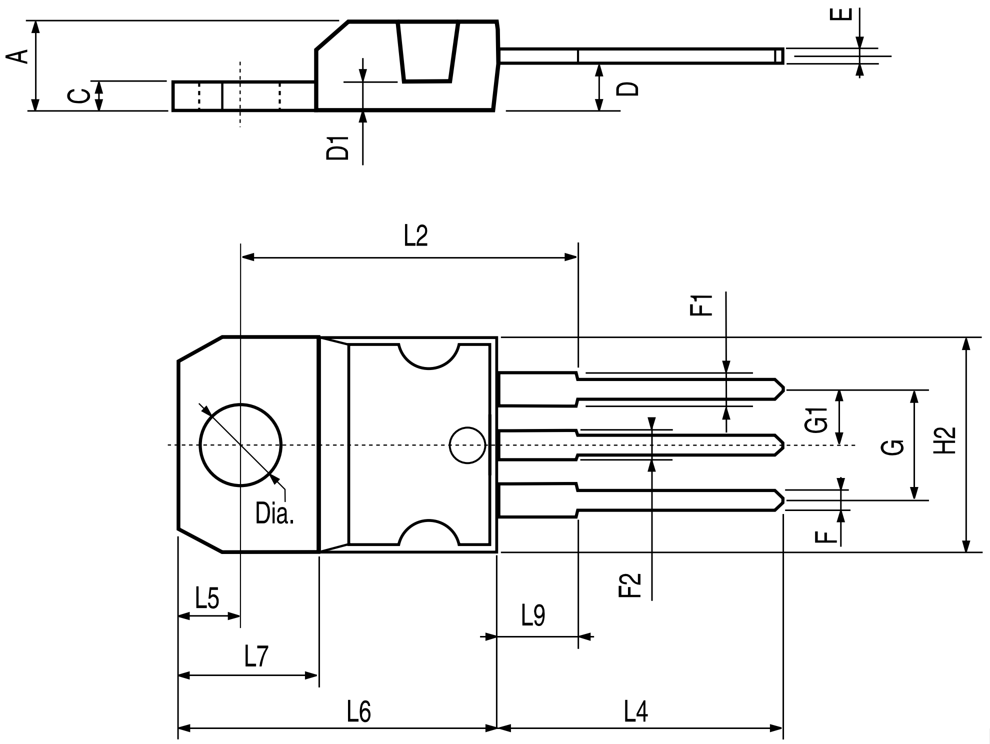
Figure 20 : Distributed Supply with On-card L4940 and L4941 low drop regulator



ADVANTAGES OTF THESE APPLICATION ARE:
On card regulation with short-circuit and thermal protection on each output.
Vary high total system efficency due to the switching preregulation and very low-drop postregulation

TO-220 MECHANICAL DATA

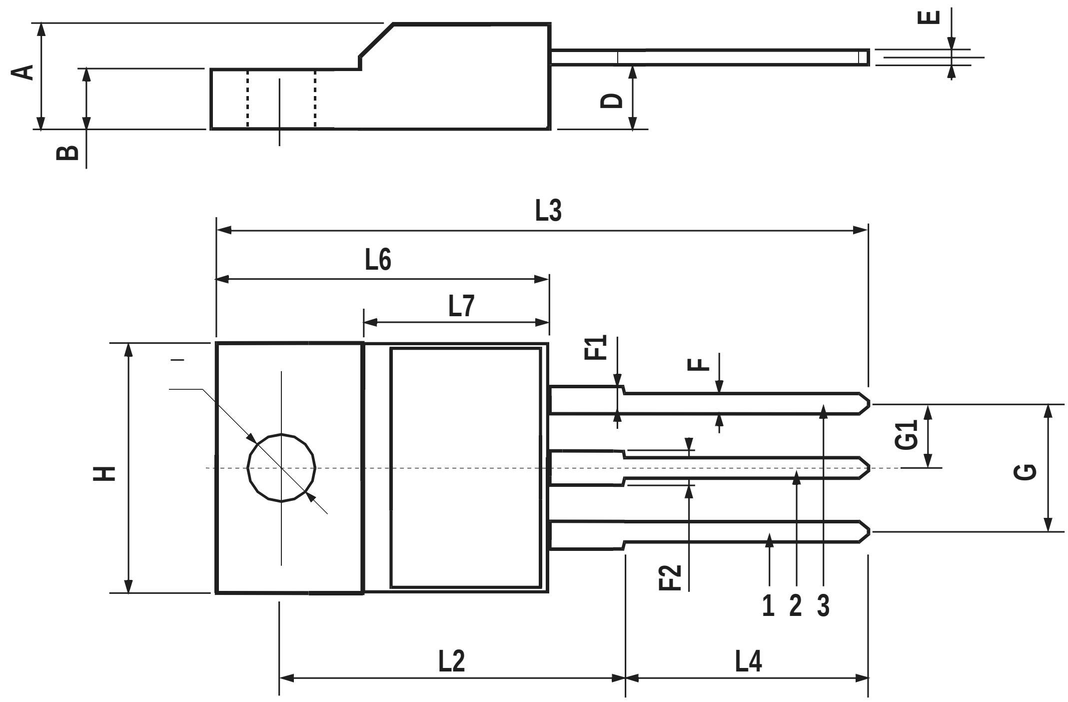
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



P011C

TO-220FP MECHANICAL DATA

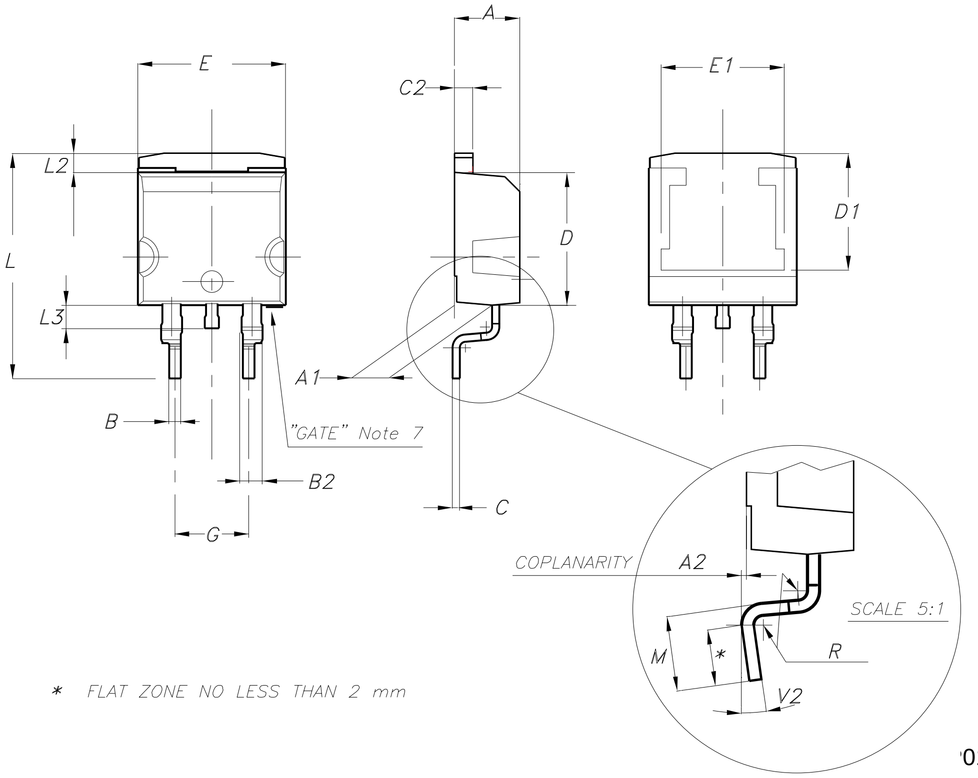
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
B	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
E	0.45		0.70	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.15		1.50	0.045		0.059
F2	1.15		1.50	0.045		0.059
G	4.95		5.2	0.194		0.204
G1	2.4		2.7	0.094		0.106
H	10.0		10.40	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
DIA.	3		3.2	0.118		0.126



7012510/G

D²PAK MECHANICAL DATA

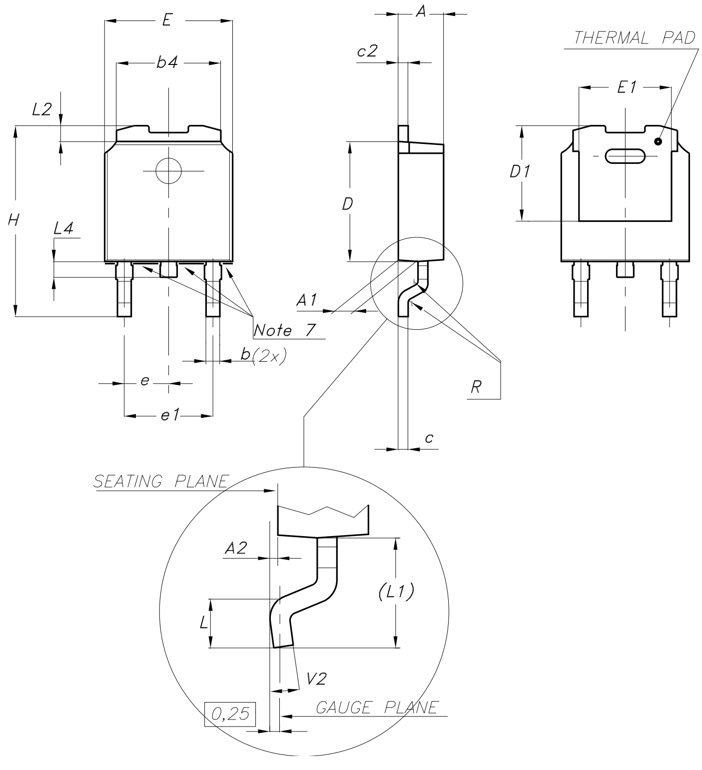
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		0.409
E1		8.5			0.335	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.624
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068
M	2.4		3.2	0.094		0.126
R		0.4			0.016	
V2	0°		8°	0°		8°



'011P6G

DPAK MECHANICAL DATA

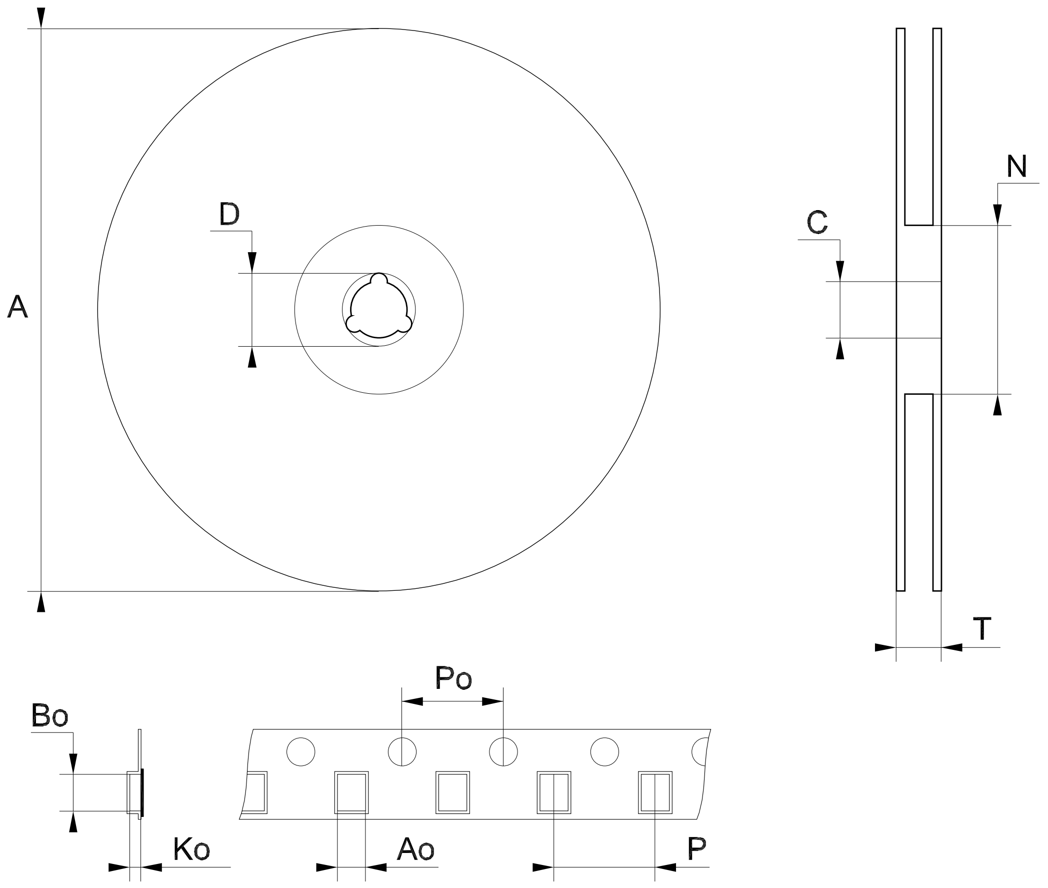
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	2.2		2.4	0.086		0.094
A1	0.9		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.9	0.025		0.035
B2	5.2		5.4	0.204		0.212
C	0.45		0.6	0.017		0.023
C2	0.48		0.6	0.019		0.023
D	6		6.2	0.236		0.244
D1		5.1			0.200	
E	6.4		6.6	0.252		0.260
E1		4.7			0.185	
e		2.28			0.090	
e1	4.4		4.6	0.173		0.181
H	9.35		10.1	0.368		0.397
L		1			0.039	
(L1)		2.8			0.110	
L2		0.8			0.031	
L4	0.6		1	0.023		0.039



0068772-F

Tape & Reel DPAK-PPAK MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.80	6.90	7.00	0.268	0.272	0.2.76
Bo	10.40	10.50	10.60	0.409	0.413	0.417
Ko	2.55	2.65	2.75	0.100	0.104	0.105
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	7.9	8.0	8.1	0.311	0.315	0.319



Note: Drawing not in scale